

In the Claims:

1. (Amended) A system for cooling coated semiconductor substrates, said system comprising:
  - a chamber adapted to receive at least one coated semiconductor substrate;
  - a coupling for placing the chamber in fluid communication with a fluid reservoir;
  - an inlet valve attached to the coupling for controlling a flow of fluid between the fluid reservoir and the chamber; and
  - a controller for controlling the inlet valve.
2. The system of claim 1 wherein the coupling is attached to a fluid reservoir and the pressure drop across the inlet valve is at least about 10 bar.
3. The system of claim 2 wherein the pressure drop across the inlet valve is at least about 100 bar.
4. The system of claim 1 wherein the controller controls the temperature of the fluid at a point within the chamber.
5. (Amended) The system of claim 1 further comprising an outlet valve for controlling the flow of fluid out of the chamber, wherein the controller also controls the outlet valve.
6. The system of claim 5 wherein the controller controls the rate of fluid flow through the chamber.
7. The system of claim 1 wherein the fluid entering the chamber from the reservoir substantially mixes with fluid already in the chamber before contacting the substrates.
8. (Amended) The system of claim 7 further comprising a baffle, wherein the fluid flowing into the chamber is directed against the baffle.

---

21. (Amended) A system for cooling coated semiconductor substrates, said system comprising:

a first sub-system for cooling a fluid using the Joule-Thompson effect; and

a second sub-system for contacting the coated semiconductor substrates with the cooled fluid, the second sub-system being in fluid communication with the first subsystem.

---